



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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June 21, 2002

TO: Internal File

FROM: Priscilla Burton, Reclamation Specialist (Soils) and Team Lead *PB*

RE: Lila Canyon Extension. Horse Canyon Mine. Utah American Energy, Inc.
007013-PM02B.

SUMMARY:

The Division received an application to include the Lila Canyon Mine area into the Horse Canyon Mine permit on February 11, 2002. The first review of the submittal resulted in a list of deficiencies dated March 26, 2002. The Permittee's response was received April 25, 2002. This technical memo reviews the information received to date from the Permittee, letters of comment from the public, and the Informal Conference requested by the Southern Utah Wilderness Alliance (SUWA) on May 21, 2002.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

The U.S.D.I. Bureau of Land Management and the U.S.D.I. Office of Surface Mining published an Environmental Assessment of the Lila Canyon Project (EA No UT-070-99-22) in July 2000. The Division received the Permit Application Package on February 11, 2002.

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Public notice of the Permit Application Package was placed in the Emery County Progress on February 28, March 7, 14 and 21, 2002. A copy of the newspaper advertisement has been made part of the Mining and Reclamation Plan in Appendix 1.5. In accordance with R645-300-121.100 *et seq*, the notice identifies the name and business address of the applicant; provides a map showing the Horse Canyon Mine permit area and the adjacent boundaries of the proposed Lila Canyon extension permit area and identifies the boundaries using Township and Range and Section; and provides three locations for public inspection of the PAP; and gives the name and address of the Division. Also included in the public notice is a concise statement describing the application as an extension to the existing Horse Canyon Mine to be known as Part B Lila Canyon extension, to be processed as a new permit.

During an informal hearing, SUWA commented on the adequacy of the public notice, in particular, questioning the link between the Horse Canyon Mine permit and Part B: Lila Canyon extension. The Division maintains that reviewing the application for Part B: Lila Canyon extension as a new permit follows the requirements of R645-303-222.

Written comments were received from six concerned citizens and two organizations within thirty days of the last publication date of the public notice. The two organizations providing comment were the Southeastern Utah Association of Local Governments (SUALG) and the Southern Utah Wilderness Alliance (SUWA).

An Informal Hearing was requested by SUWA and was held on May 21, 2002 at the Division Office in Salt Lake City. The comments made during the hearing are part of the public record and are referred to throughout this Technical Analysis of the mine permit application package (PAP).

Not included in the public notice was notification of mining within 100 feet of the outside right-of-way a public road (R645-300-121.150).

Findings:

The Permittee has not met the requirements of the Regulations for Public Notice. Prior to approval and in accordance with,

R645-300-121.150, The Permittee must provide public notice of the intention to conduct mining within 100 feet of the outside right-of-way of the public roads and timing and duration of closure during installation of a culvert in the existing public road

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

An Order I Soil Survey was conducted of the proposed Lila Canyon extension disturbed area was conducted in August 1998 by Dan Larsen, Soil Scientist, Environmental Industrial Services, Inc., Helper, Utah.

Findings:

Information provided in the application does not meet the minimum Technical Data Reporting requirements of the Regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-130, Include in PAP the qualifications of the consulting soil scientist.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The Horse Canyon Mine is in the Book Cliffs coalfield in Emery County near East Carbon and Sunnyside, Utah. The topography of Horse Canyon and Lila Canyon are shown on the Cedar and Lila Point 7.5 Minute Quad maps, produced by the Geological Survey of the U.S. Department of the Interior, 1985.

In its location on the western slope of the vast and largely undeveloped Tavaputs Plateau, the proposed area of development includes some areas that are designated as Wilderness Study Areas and some designated as Wilderness Inventory Areas. The proposed Lila Canyon portal site lies just five miles from State Highway 6 and is immediately adjacent to an "unimproved" road (Plate 1-1).

The existing Mining and Reclamation Plan (MRP) for Horse Canyon is referred to as Part A and the application for Lila Canyon Extension is referred to as Part B. The permit area for Horse Canyon Part A is 1,328 acres and the proposed permit area for Lila Canyon Extension Part B is 4704 acres. The combination of Horse Canyon Part A and Lila Canyon Extension Part B would bring the total new permit area to 6,032 acres.

The Lila Canyon Extension (Part B) site has a southwest aspect at the base of the Book Cliffs. The pediments are composed of sandstone over shale with a prevalence of cobbles, stones and boulders. It is an erosional environment. The soil receives protection from surface rocks, vegetation and biologic soil crusts.

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Salt desert shrub and juniper are the predominant vegetative communities.

Findings:

The information provided is adequate for the purposes of the regulations.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

The permit area is shown on Plate 1-1 and other maps. The permit boundaries are divided into Permit Area A, the Horse Canyon project and Permit Area B the Lila Canyon Extension.

The mine site is located in T.16S, R.14 E, Section 15, SE 1/4 SW 1/4. The proposed mine site is located upon an alluvial/colluvial bench at an elevation of 5,800 to 6,500 feet where the two forks of Lila Canyon converge. Page 15 of Chapter 1 says approximately **40.77 acres** will be disturbed. Page 90 of Section 542.200 also indicates **40.77 acres** will be disturbed. But page 1 of Appendix 5-8 indicates that **48.23 acres** will be disturbed. Chapter 2, page 11 indicates that only **25 acres** of topsoil will be salvaged. Plates 1-2, 5-1 and 5-2 show islands of "undisturbance." All sections of the PAP must be consistent in the description of the disturbed area boundary.

The Permit Area is reported on page 14 of the PAP as **6,032.07 acres** (for both A, Horse Canyon and B, Lila Canyon). This figure does not match the **5,544.01 acres** listed on page 11 and in Table 1-1 for federal acres within the permit area, because the 6.032.07 figure includes surface acreage within the permit area that is not federal leases. i.e. private and state acreage as shown on Table 4-2. The Permittee should explain this discrepancy within the PAP.

Table 4.2 of the PAP lists the total federal acres for A & B portions of the mine as **4,296 acres**. This figure does not match the federal acreage of **5,544.01 acres** on page 11 and in Table 1.1. The Permittee should explain this discrepancy within the PAP as well.

Findings:

The disturbed acreage must be clearly stated in the narrative. Prior to approval, in accordance with:

R645-301-116.100, The Permittee must clearly state the anticipated number of acres of surface disturbance to be affected during the life of the mine and statements of the number of disturbed acres must be consistent within the PAP.

R645-301-521, The Permittee must explain and clarify the discrepancy between the acreage given for permit area on page 11, 14, Table 1.1 and Table 4.2

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The proposed mine site is in an area that receives an average annual precipitation of approximately 14 inches. The Permittee indicates an average annual precipitation as high as 13.69 inches: the information was downloaded from the Western Regional Climate Center and is shown in Table 7-1A in Section 724.413. Table 7-1A shows the average maximum and minimum temperatures by month over thirty years (1958 –88) for the Sunnyside area. Table 7-1A also includes average annual precipitation by month and annually (13.69 inches annually) and average snowfall by month and annually (36.5 inches annually).

The closest weather station to the Lila Canyon Lease is located at Sunnyside, Utah. Based on relatively close proximity and similar locations, the west exposure of the Book Cliffs, the data from this station will be used to verify precipitation amounts and other weather conditions for the Lila Canyon Project. A rain gauge is recommended for the purposes of complying with the Air Quality Approval Order.

Findings:

Information provided in the application is not adequate to meet the minimum Climatological Resource requirement of the Regulations. Prior to approval, in accordance with:

R645-301-724.420, The Permittee must commit to installation of a rain gauge at the site to comply with the reporting requirements of the Air Quality Approval Order dated August 27, 1999(page 5).

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Elevation of the proposed mine facility is from 5,800 to 6,500 feet. The Soil Survey (Section 3.2 of Appendix 2-3) indicates an average annual precipitation of 8-14 inches with the majority of the precipitation coming in Fall, Winter and early Spring. The soil resources within the Lila Canyon Extension are discussed in Chapter 2, Sections 210 through 224 of the PAP.

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Mr. Daniel Larsen, Professional Soil Scientist with Environmental Industrial Services conducted an Order I soil survey of the disturbed area in August of 1998. His report is located in Appendix 2-3. (An addendum attached to Appendix 2-3 is for the proposed fan portal site soils.) The survey contains soil descriptions, soil pedon descriptions, soil salvage suitability analysis, laboratory soil testing data, field soil profile descriptions, soil and landscape photographs, a soils map, and a salvageable-soils map. All mapping and soil survey work were performed according to the standards of the NRCS's National Cooperative Soil Survey.

Soil Identification and Description and Productivity

The predominant soil classification was Strych fine sandy loam, loamy-skeletal, mixed mesic Ustic Haplocalcid (formerly classified as Ustollic Calciorthids in the 1988 Carbon County Soil Survey).

Order: Aridisol (formed in desert climate)
Suborder: Calcic (accumulation of calcium carbonate)
Great Group: Haplocalcid (other calcids)
Subgroup: Ustic Haplocalcid
(moisture control section is dry less than $\frac{3}{4}$ of the time when the temperature is above 5 C and aridic soil moisture regime bordering on ustic)
Family: loamy-skeletal, mixed mesic (soil temperature)
Series: Strych fine-sandy loam
Phases: bouldery, very bouldery, extremely bouldery

Also found at the site were two soils with little pedogenesis and little horizonization, classified as Gerst silt loam, loamy, mixed (calcareous), mesic, shallow Ustic Torriorthents

Order: Entisol (young soil, little pedogenesis)
Suborder: Orthent (lack of clay accumulation)
Great Group: Torriorthent (aridic moisture regime)
Subgroup: Ustic Torriorthent
(moisture control section is dry less than $\frac{3}{4}$ of the time when the temperature is above 5 C and aridic soil moisture regime bordering on ustic)
Family: loamy, mixed (calcareous), mesic
Series: Gerst silt loam
Phase: shallow

and Travessilla fine sandy loam, loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Order: Entisol
Suborder: Orthent
Great Group: Torriorthent
Subgroup: Lithic Ustic Torriorthent (lithic contact within 50 cm)
Family: loamy, mixed (calcareous), mesic
Series: Atchee Series (formerly Travessilla series)
Phase: none given

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The soils were mapped using the following designations:

DSH = Strych fine sandy loam variant, 3 to 8% slopes
SBG = Strych bouldery fine sandy loam, 5 to 15% slopes
VBJ = Strych very bouldery fine sandy loam, 5 to 15% slopes
XBS = Strych extremely bouldery sandy loam, 10 – 45% slopes
RBL = Rubbleland- Strych-Gerst complex, 20 – 70% slopes
RBT = Rock outcrop – Travessilla family complex, Atchee Series

From the soil description sheets in Appendix 2-3 and Plate 2-2 Detailed Soils Map of the Mine Facilities Site, the Division notes that the canyon bench holds deep soils, stabilized from wind erosion by a surface layer of biological soil crusts, dried plant litter, boulders and live plant cover. The A horizon layer varies due to position on the slope from three inches (at sample site LC 1 through 3) to 26 inches deep (at sample site LC 4). The B horizon stretches from 31 – 60 inches in the profile and is the zone of accumulation of carbonates. The deepest soils are pockets of colluvium from the cliffs above. The soils are underlain by sandstone bedrock, except at the location of the fan portal where shale and burned coal cover the sandstone rock layer. Shale was also encountered at LC 3 and LC 5 (see discussion of SAR and EC below).

Soils are subject to extremes of temperature. On August 6, 1998 at 11:30 a.m., the temperature of the bare soil at location LC4 was 130 F. At a depth of 20 inches, the temperature was 65 F. These soils are in a mesic soil temperature regime. That means that the mean annual soil temperature at 50 cm is less than 59 F as estimated from the mean annual air temperature of 46 F, reported in Section 220. Mr. Larsen has judged the soil moisture regime to be aridic, bordering on ustic, which is to say that at a depth of 20 inches (50 cm), there is a difference in soil temperature greater than 9 F between summer and winter and the soil moisture control section from 12 – 35 inches deep for sandy soil is dry for 90 or more cumulative days in most years, but it is not dry in all parts for more than half the time that the soil temperature is above 9 F at a depth of 50 cm. (Soil Survey Staff. 1990. Keys to Soil Taxonomy, fourth edition. SMSS technical monograph no.6. Blacksburg, Virginia. pp 33 –35.)

The disturbed area vegetation is primarily pinyon-juniper and grass-shrub communities (see Figure 1, Appendix 3-2). On good years the grass-shrub can be expected to produce 600 – 800 lbs/acre and the pinyon-juniper can be expected to produce 250 - 300 lbs/ac (see Appendix 3-7).

Soil Characterization

Soil pedon descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons were sampled and analyzed according to DOGM guidelines for topsoil and overburden. (Leatherwood, J. and Dan Duce. 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.) Soil texture, rock fragment content (percent by volume), and Munsell color were determined in the field. Generalized soil properties, including percent surface stones and boulders, are summarized in Table 3.21, Properties of Soil Map Units, on page 9 of Appendix 2-3. Soil sampling locations

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are shown on Plate 2-2, Detailed Soils Map of the Mine Facilities Site.

Soil samples were sent to InterMountain Laboratories, Inc. for analysis. Appendix C of Appendix 2-3 contains the laboratory data sheets for all analysis on the 22 samples and duplicate analysis. Overall, soil laboratory test results show a good rating for soil chemistry and fair rating for soil water holding capacity after correction for coarse fragments (Appendix B of Appendix 2-3), except as noted below:

LC1 was rated poor for water holding capacity below 10 inches (after coarse fragment correction)

LC3 was rated poor at depth of 24 – 48 inches for pH = 8.6

LC3 was rated unacceptable at depth of 48 – 53 inches for Sodium Adsorption Ratio (SAR) = 18 and Exchangeable Sodium Percentage (ESP) = 22%

LC5 was rated poor below three inches for water holding capacity and unacceptable for coarse textured soils at depth 40 – 58 inches for SAR = 15, Electrical Conductivity (EC) = 8.89 mmhos/cm, and pH 8.2.

LC10 was rated fair at 0 – 4 inch depth for an EC = 2.58

LC 11 and LC 12 entire profiles were rated poor for water holding capacity after correction for coarse fragments.

The percent rock content within the proposed facilities area is the main deterrent for soil salvage suitability based on the current Division guidelines (citation previously noted). However, Appendix 2-3 indicates that native soils, with a higher rock content than the current guidelines allow, can and should be salvaged.

Organic matter content is relatively low in these soils. Generally, the surface soils ranged between 1.0 to 1.5% organic matter and the subsoils were about 0.5 percent. Total nitrogen and available phosphorus were not analyzed. A measure of total nitrogen and available phosphorus is required by the Division for baseline information so that fertilization of the reclaimed site can attempt to mimic the natural conditions.

A calcic horizon was verified in soil pedons LC1, LC5 and LC6 with calcium carbonate ranging between 20 to 21%. Pedons LC3 and LC4 have some calcium carbonate accumulation in the subsoil but it is less than the 15% needed to be classified as a calcic horizon. Below the calcic horizon, at depths of 30 inches, the soluble calcium decreases and magnesium increases with depth. Usually, the reverse is the case where calcium exceeds magnesium in the soil solution, because calcium is retained much more readily than magnesium on soil colloid exchange sites. But in this case, calcium is being removed from the soil solution by calcium carbonate precipitation in the calcic layer. As a result, soluble magnesium exceeds soluble calcium in the lower soil horizons.

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In accordance with R645-301-232.200, since the A horizon is less than six inches deep, the topsoil recovered will be a mix of both the A and B horizon soils. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

Findings:

The information did not provide baseline soil nitrogen or phosphorus as required by the Utah Guidelines for topsoil and overburden. Prior to approval and in accordance with:

R645-301-222.400, The Permittee should provide baseline soils analyses of total nitrogen and available phosphorus for the six soil map units.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial valley floor determination

This section summarizes the land use, soil, plants, geology, surface- and ground-water information reviewed by the Division in making the findings required under R645-302-320.

The Lila Canyon Extension is situated in the western Book Cliffs escarpment. Steeply dipping joints transmit ground water from the surface (6.5.3.5) as illustrated in Figure VI-5. Water inflow associated with fault or fracture systems are possible, but not expected to be significant (Section 6.6.1). The surface expressions of the faulting are grabens and draws. Numerous small seeps and springs exist within and adjacent to the permit area (Section 731.220). Appendix 7-3 Probable Hydrologic Consequences (PHC) of mining concludes that the proposed mine is not expected to cause "contamination, diminution or interruption" of underground or surface sources of water.

The Sunnyside Sandstone contains the two seams of interest: Upper Sunnyside and Lower Sunnyside Seams. "The Sunnyside Sandstone is known to transmit groundwater in the Sunnyside area and that portion of the sandstone which underlies the Lower Sunnyside seam is occasionally considered to be a potential aquifer" (Section 6.4.1). Geneva Mine (now known as the Horse Canyon Mine) records indicate that the mine was dry until the Sunnyside Fault was intercepted. This suggests that as mining progresses down dip, "substantial" water may be encountered, but this water will be isolated from the surface recharge zone (Section 6.6.3.1).

The Mancos Shale forms the slopes below the base of the Book Cliffs, overlain in places by pediment deposits (Section 6.4.1 and Plate 6-1). In the permit area, drainages flow in response to snow melt and precipitation events (Section 731.220 and Plate 7-1). Coleman Wash

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receives the Lila Canyon drainage. Grassy Wash and Marsh Flat Wash collect the flow from the Mancos slopes further south. Little Park Wash channels the flow on the plateau above. There is no valley holding a perennial stream in the permit area (Section 724.700).

Order III soil survey (Plate 2-1) of the mine permit area soils indicates that the soils on the plateau in Little Park Wash are Neto Fine Sandy Loam (Section 220.200). No further information on this soil is available in the PAP. This soil is comparable to the Glenberg soil described in the published Carbon County Soil Survey, according to Mr. Leland Sasser (telephone conversation between Priscilla Burton of DOGM and Mr. Leland Sasser, Soil Scientist and Survey Project Leader with the NRCS, Price Field Office, Utah on 06/05/01).

Plate 3-2, Vegetation indicates that the dominant species growing on the plateau in the vicinity of Little Park Wash are Atriplex, Artemesia and Elymus, none of which are wetland species, according to Cooper. (Cooper, David J. 1989. A Handbook of Wetland Plants of the Rocky Mountain Region. EPA Region VIII.) Little Park Wash falls within the Little Park grazing allotment (Plate 4-2). The land use is unimproved rangeland and wildlife habitat.

There is no farming activity upstream or downstream of the permit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor. Based on the information provided in the plan, in accordance with R645-302-321.100, the Division determines that there is no probable existence of an alluvial valley floor. A final determination will be made after all requested resource information has been received.

Findings:

A final determination regarding the existence of an alluvial valley floor will be made after all requested resource information has been received.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

The Natural Resources Conservation Service (NRCS) determined in 1998 that there are no Prime Farmlands at the site (see Appendix 2-1).

Findings:

The Division concurs with the NRCS determination made in 1998 that there are no Prime Farmlands at the site.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

General

The Permittee proposes to develop surface facilities and mine portals near Lila Canyon. The Lila Canyon surface facilities will be used to access coal reserves in the southern area of the permit. The surface facilities are located in the S1/2 of Section 15, T. 16 S., R. 14 E. See Plate 5-5 for the Lila Canyon Extension workings.

The average gradient of the Lila Canyon Extension site is 10%. Access to the lower Sunnyside seam at this location requires tunneling from the base of the cliffs upwards at a 12% slope through a sandstone rock slope for a distance of approximately 1,200 feet. The rock material from two of these tunnels and the portal face-ups will be utilized to create a pad for surface facilities. Other cut/fill pads will be constructed from subsoils.

The ventilation portal will be driven from underground workings to the surface. See Plate 5-2 for the locations. Initial mining will be conducted by room-and-pillar methods in the Lower Sunnyside Coal Seam. Production in the first year is estimated to be 200,000 tons, the second to fifth year 1,000,000 to 1,500,000 tons per year. If demand increases, the Permittee will install longwall equipment and production could peak at 4,500,000 tons per year.

The PAP proposes mine portal access, ventilation portal, elevated conveyor, coal storage pile and reclaim system, crusher, truck loop and truck loadout, warehouse and storage yard, office, parking and bathhouse facilities, substation, water storage and water treatment facilities (leach field), topsoil storage pile and sediment pond to be developed (Section 520 and Plate 5-2).

SUWA raised the question of why new portals are needed for access to the new leases. Although the topic was discussed in the Environmental Assessment (USDI, EA No. UT-070-99-22, 2000), a description of the environmental, safety, technical/engineering and economic reasons for development of a new portal site should be included in the PAP.

To support the new center of activity, Emery County will upgrade the existing County Road #126 from State Highway 6 to a corral and from this point will upgrade unimproved roadway RS 2477 from the corral to the Lila Canyon Extension surface facilities (Appendix 1-4).

Findings:

The information provided does not adequately explain the need for new facilities at the Horse Canyon Mine. Prior to approval and in accordance with:

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R645-301-521.190, The Permittee must explain the environmental, safety, technical/engineering and economic reasons for building new portals and facilities.

R645-301-532.100, the Permittee must explain why Horse Canyon facilities are not being reclaimed concurrently with the development of the Lila Canyon Extension.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

The PAP proposes new portal, loadout and office facilities to be developed near Lila Canyon. Currently the road to the site is unimproved as shown on Plate 1-1. To support the new center of activity, Emery County will upgrade and pave the existing County Road #126 (2.63 miles) and RS2477 roadway from State Highway 6 to the Lila Canyon Extension surface facilities (Agreement between Emery County and UEI dated October 19, 1999).

The permitting status of the road was questioned by the Division recently when an article entitled "Utah DOGM Office Clears Way to Process Lila Canyon Permit," was published in the Sun Advocate, Thursday February 28, 2002. The press release stated that UEI planned to build a 4.7 mile road from the mine site to a Union Pacific rail line. A public notice placed in both the Sun Advocate and the Emery County Progress in April 2002, subsequently clarified that Emery County will construct and improve the 4.7 mile road from the mine site to U.S. Highway 6.

Further documentation was not included in the PAP to provide background on usage and ownership of three existing unimproved roads:

- from Horse Canyon to the mine site,
- County Road #126 from Highway 6 to the mine site, and
- unimproved road RS2477 south of the mine site.

The PAP states in Section 521.133 that UEI does not propose relocation of the public road. The county road will fall partly within the permit area (Section 521.123 and Plate 5-2), and a culvert will be replaced beneath the county road (Section 521.170).

Appendix 1-4 of the application contains a copy of a letter from the Emery County Road Department dated January 10, 2001. The letter states the following:

"Said approval authorizes mining activities to be conducted within 100 feet of the public road with the provision that, to provide for public safety, a 6 foot chain link fence shall be constructed adjacent to the road right-of-way in the vicinity of the surface facilities area.

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“Additionally, the location of the fence must not restrict continued public use of the road.”

Plate 5-2 shows that the chain link fence will border the road.

The Permittee will either construct culverts under the county road within the disturbed area, or contract with the county to construct culverts under the county road. The culverts will be used to pass water from the undisturbed drainages and for spillways for the sediment pond. The Permittee needs to describe how the public will be protected during installation of the culverts.

Findings:

The information provided in the PAP does not adequately describe the relocation of the public road. Prior to approval and in accordance with:

R645-301-521.190, The Permittee must provide documentation on usage and ownership for the unimproved road from Horse Canyon to the mine site, County Road #126 from Highway 6 to the Lila Canyon Extension, and RS2477 south of the mine site.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-420.

Analysis:

First year production from the mine is estimated to be 200,000 tons, increasing in the second through fifth year to between 1,000,000 and 1,500,000 tons. Long wall mining could be utilized to generate as much as 4,500,000 tons a year (Section 523).

Appendix 4-3 contains correspondence between UEI and the Department of Environmental Quality, Division of Air Quality (DAQ). In the cover letter for the Notice of Intent dated December 22, 1998, UEI requested approval for a Minor Source of up to 2,000,000 tons/year. An Approval Order (DAQE-702-99) was issued August 27, 1999.

The Approval Order (AO) indicates public comments were considered in developing the requirements of the AO for this new source. The DAQ received five public comments on degradation of the environment in general and one comment referring to air quality degradation in particular.

The AO is predicated on UEI operating according to the Notice of Intent submitted to the DAQ on December 24, 1998, and additional information submitted to the DAQ on February 19, 1999 and May 11, 1999.

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The following equipment was approved with the AO:

- One enclosed crusher rated at 500 tons/hr equipped with dust suppression spray at its exhaust.
- One truck loading facility with enclosed 450 tons surge bin and sprays as needed
- One stacking tube with associated coal stockpile
- One reclaim system conveyor
- Associated conveyors equipped with dust suppression sprays at all transfer points.
- Mobile diesel equipment.
- 0.68 miles of paved road, posted speed limit 25 mph.

The requirements of the AO include:

- annual training of employees;
- control of disturbed or stripped areas through treatment;
- maintenance of 4.0% moisture content of fines;
- watering storage piles;
- limitations on the silt-size coal fines in stored coal and haul roads;
- visible emissions limits;
- maintaining the surface material in a damp/moist condition;
- a production **limit of 1,500,000 tons of coal** per rolling 12 month period;
- **a consumption limit of 63,000 gallons of diesel fuel** per rolling 12 month period;
- use of #2 fuel oil only; and
- sulfur content of fuel oil or diesel is not to exceed 0.5% by weight

The AO from the DAQ ensures that particulates and pollutants will be controlled through very specific dust suppression requirements, pollution control equipment, limited fuel consumption and proper equipment maintenance, limited production, employee training and record keeping. The Division finds that the Permittee has obtained the required DAQ permit and is in compliance with that permit.

Findings:

The information provided meets the minimum regulatory requirements of the Air Pollution Control Plan section of the Rules.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

As part of the federal mine plan approval and to meet the requirements of the federal leases, the Permittee is required to submit a resource recovery and protection plan (R2P2) to the BLM. The BLM staff analyzed the R2P2 for maximum economic recovery and found that the Permittee met that requirement.

The Division staff reviewed the mine plan and found no significant coal reserves within the permit area that were not being recovered. The Division bases their findings on several factors including technical analysis from other agencies, such as the BLM, for maximum coal recovery.

Coal will be recovered using a continuous miner. Section 522 discusses the use of barrier pillars to isolate the Horse Canyon Mine from the new Lila Canyon Extension, to ventilate, to provide independent escape routes, to protect escarpments, and to possibly retain large quantities of mine water.

The first year production is estimated to be 200,000 tons, increasing in the second through fifth year to between 1,000,000 and 1,500,000 tons. Plans project the utilization of longwall mining to generate as much as 4,500,000 tons a year (Section 523). An increase of this size would require modification of the MRP.

Federal leases cover 5,544 acres of coal reserves (Table 1.1 and page 11 of Chapter 1), but the coal recovery will be from 4,296 federal acres according to Table 4.2.

Findings:

The information provided is adequate to describe the complete recovery of coal.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Removal and Storage

The Permittee has outlined a disturbed area boundary on Plate 5-2 and has shaded undisturbed areas within those areas on Plate 5-2. The PAP indicates in Section 232.100 that "surface disturbance may not be required on all of the acreage identified as the disturbed area." The difference between the acreage falling within the disturbed area boundary (48 acres) and that to be disturbed (25 acres) is shown in the Available Soil Resources Table in Section 232.100. Since Regulation 645-301-232.100 requires topsoil removal from all disturbed areas, further explanation of the need to include 23 acres of undisturbed land within the disturbed area

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boundary has been requested.

For the purposes of removal, the PAP defines topsoil as all soil from the surface down to eighteen inches (Section 231.100). Plate 2-3 Soil Salvage and Replacement provides guidance for the topsoil removal. Plate 2-3 shows removal of eighteen inches of topsoil from the central and northwest portion of the disturbed area with twelve to eight inches being removed from the roadway and twelve to eighteen inches removed from the sediment pond location and eight to eighteen inches removed from beneath the coal stockpile and coal storage bin. A soil scientist will be on-site during topsoil removal (Section 231.100).

The PAP describes topsoil removal in several sections in the plan as follows:

- The depth of "topsoil" removal will be eighteen inches "from those areas of the mine yard where material will be excavated in order to achieve final yard configuration," (Section 232.100).
- "The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area." (Section 232.200)
- "Available underlying soils will be salvaged from stony disturbed areas" (Section 232.710).
- "If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3)." (Section 232.100).

Soils will be removed from all disturbed areas to a depth of eighteen inches or to shale (Section 232.300) with the following exceptions:

- The steep rocky slopes within the disturbed area below and between the conveyor and coal storage pile (Section 232.710).
- The two bents to be constructed for the conveyor.
- The area of topsoil storage, except that topsoil will be removed from the access road to and around the topsoil pile, but not from beneath the topsoil pile (Section 232.100).
- From undisturbed islands within the disturbed area (Section 234.220).

The Permittee has committed in Section 232.710 to keeping the native soils (beneath the conveyor and in undisturbed islands) free of coal accumulations by vacuuming the slope and by installation of jersey barriers to protect the slope from encroachment by the coal stockpile. The PAP indicates "the feasibility of a conveyor pan will be analyzed." The Division also requests that the best technology is utilized and that would be a completely enclosed conveyor or conveyor pan.

Soils available for salvage are indicated in a table of Available Soil Resources in Section 232.100. The table indicates that 61,512 loose cubic yards of soil may be available for storage in the topsoil pile. The table divides salvageable soil by map unit type. Soils will be removed from the 25 acres to be disturbed with a crawler-tractor, grader, front-end loader, and/or trackhoe.

Soil removal will pulverize the soil into powder unless the soil moisture content is between 10 and 15% as described on page 60 of The Practical Guide to Reclamation in Utah,

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available in PDF format at web site <http://dogm.nr.state.ut.us/> . Ensuring that the soil is neither too dry, nor too wet during removal operations may entail timing of operations during a favorable season or watering the soil to optimum moisture content before beginning removal.

The Permittee commits in Section 232.500 to maintaining records of materials removed and placement of materials either in the topsoil storage pile or in the fill. The Permittee also commits to having a certified soil scientist on site during construction and reclamation phases (Section 232.100). The soil scientist would log pedestal heights to verify soil removal depths (Section 232.500). Further the PAP provides a commitment to develop As-Built maps showing where subsoil materials have been used as fill material (Section 232.500).

SUWA commented on the need for soil-borrow areas. Topsoil will be recovered from all disturbed areas (from a minimum depth of 6 inches from RBT soil up to 18 inches from VBJ, SBG and DSH soils). The total recovery of topsoil is estimated at 52,000 bank cubic yards. On the average, this represents a salvage depth of 15 inches over the 25 proposed disturbed acres. Furthermore, the Permittee indicates in the PAP (Section 233) that no substitute topsoil will be necessary based upon the Order 1 Soil Survey that indicates subsoils are also suitable for plant growth down to a depth of 48 inches. There is no need to develop a soil borrow area.

Storage of the approximately 60,000 loose cubic yards of topsoil will be in a stockpile with the approximate dimensions shown on Figure 1 of Chapter 2: 26 feet height, 246 feet length, 146 feet width. The PAP inaccurately relates the dimensions of the topsoil pile for a 26 feet high pile in Section 232.100. The operational topography shown on Plate 5-7A-2, does not show the proposed topsoil stockpile in cross section 4+00.

The topsoil stockpile is located on Plate 5-2 and Plate 5-7. Topsoil stockpiles will be protected from upstream flow by drainage ditches. The surface of the stockpile will be pitted to retain moisture and reduce erosion (Section 231.100 and 231.400). The Division notes that this practice is described in the Practical Guide to Reclamation (DOGM, 2000), available at <http://dogm.nr.state.ut.us>. The topsoil will be retained in place with the use of berm/ditches or silt fences surrounding the pile. The stockpile will be mulched and seeded using the mix in Table 3-4, after September 15 (231.400).

Table 3-4 Interim and Final Reclamation Seed Mix includes Yellow Sweet Clover, Alfalfa and Forage Kochia at the request of the BLM, "based on their proven benefits to wildlife and domestic stock as well as their ability to provide erosion control and their widespread distribution as a result of previous seeding public lands." The Division has requested modification of the species mix in Table 3-4 under Operation Plan Vegetation (See deficiency written under R645-301-331). Species in the mix should be chosen to control erosion yet maintain the natural beauty of the landscape.

The Division recommends that the surface layer of soil from 2 – 4 inches is removed with the vegetation and set aside for application to the surface of the topsoil pile after gouging. The surface layer of soil is valuable, for it contains seeds, cryptogam filaments, other microorganisms, organic matter, elevated levels of nitrogen and phosphorus. The Division recommends that the topsoil pile receive an initial irrigation after the 2 – 4 inch surface layer is

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applied, to ensure good contact, based upon the paper: Jayne Belnap, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. The biologic soil crusts established on the topsoil pile could be later harvested for inoculation of the reclaimed site.

Storage of topsoil from the topsoil access road will be in berms around the topsoil stockpile. Storage of topsoil from the fan portal will be in a berm around the fan disturbance (Section 232.100) and silt fence (Section 234.100). Plate 5-2 shows the location of the topsoil berm around the fan site. The Division anticipates that this topsoil will become covered with rock dust from inside the mine and that it will be difficult to establish vegetation on the pile with air constantly blowing across the pile. The Permittee should evaluate an alternate location for storage of fan portal topsoil.

Subsoils

In Section 232.500, the PAP refers to a Salvageable Soils Map in Appendix A-2 that is incorporated into the PAP. Although not stated in the PAP, the Division understands that the referenced Map is part of the Order 1 Soil Survey and that it is located in Appendix A-2 of Appendix 2-3. This map recommends salvage of between six and 48 inches of topsoil and subsoil from the disturbed area.

The PAP states that subsoil used to achieve four feet of cover over refuse will be excavated from the refuse disposal site and replaced over the waste (Section 232.500). (The Division is uncertain whether this includes the rock slope waste site as well as the refuse.) The PAP also indicates that subsoil from 12 – 30 inches from cut areas will be used as fill material (Section 232.500). Section 232.700 specifies the subsoil recovery for soil types SBG, DSH, and VBJ, based upon recommendations found in Part 3.4 of Appendix 2-3 Soil Inventory. The Division understands that the recovery depth in inches is the depth of salvageable subsoil remaining after topsoil removal. Thus, for SBG soil the 30 inch removal thickness would come from from between 18 inches and 48 inches in the profile.

SUWA commented that a subsoil stockpile should be required. Adequate topsoil will be salvaged from the proposed disturbed area, but the location of subsoil used as fill material will be mapped for use during reclamation (Section 232.500 and Section 241). The subsoil from the cut areas will be replaced in its approximate original location to extend rooting depth of the reclaimed site. These subsoils will be located in underneath parking areas, roads, buildings, and storage sites. These subsoils will be protected during operations by asphalt, concrete, or gravel over an impervious membrane. Contaminated subsoils will be hauled to a landfill site. (It is not clear to in the PAP what contaminants will be monitored and what monitoring will occur.)

Findings:

The Division will coordinate review of the species found in Table 3-4 with the BLM to obtain a species mix that can control erosion yet maintain the natural beauty of the landscape, an issue raised six times through public comment. Several areas of deficiency have been identified with the topsoil salvage and storage plans. Prior to approval and in accordance with:

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R645-301-231.100, The PAP must describe a method of ensuring that the soil is neither too dry, nor too wet during topsoil removal operations. This may entail timing of operations during a favorable season or watering the soil to optimum moisture content between 10 and 15% before beginning removal.

R645-301-231.400, The Permittee must accurately relate the dimensions of the topsoil pile in Section 232.100 for a 26 foot high pile as calculated in Figure 1.

R645-301-234.220, The Permittee should evaluate an alternate location for storage of fan portal topsoil.

R645-301-232.700, The Permittee must provide in the next submittal the results of the conveyor pan feasibility analysis committed to in Section 232.710 in order to apply the best technology available to protect the topsoil where it will not be salvaged on the rocky slopes below the conveyor.

R645-301-521.565, The Permittee must include the topsoil pile as a topographic feature on the cross sections of Plate 5-7A-2.

R645-301-553.252, Section 232.500 of the PAP should specify the use of subsoils as cover over the entire waste rock site, including rock slope waste and refuse and the Permittee must explain what contaminants will be monitored in the stored subsoil and how the monitoring will take place.

R645-301-232.200, Topsoil salvage described in the PAP should include salvage of the surface layer of topsoil from 0 – 4 inches along with the vegetation to be set aside for application to the surface of the topsoil pile after gouging.

R645-301-234.230, The topsoil pile construction should include the replacement of the surface 0 – 4 inches of the surface soil to the surface of the gouged pile, immediately followed by irrigation to ensure good contact with the topsoil pile.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal of noncoal waste

The PAP indicates in Section 542.640 that a minimum of two feet of cover will be placed over "road surfacing materials which are unsuitable for vegetation establishment." The Division interprets this statement to mean that road base and gravels would be buried under two feet of

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cover, but that cement and asphalt (as mentioned in the PAP, Section 542.741) would be buried with four feet of cover. The PAP should be clear on this issue.

Coal mine waste

Appendix 5.7 describes 25,000 loose cubic yards of underground development waste generated from portal development. Additional refuse will come from the operation of the screening plant and the mine itself. Appendix 5.7 indicates that there is room at the refuse disposal facility for storage of an additional 19,500 cu yards of mine waste.

Burning and burned waste utilization

Appendix 5-3 Coal Mine Waste Fire Extinguishing Plan calls for smothering potential fires with soil material. The plan indicates that the source of the soil may be that salvaged and placed in a subsoil pile for use as cover over the waste. This procedure would be unacceptable, since this soil is already committed for use as final reclamation cover.

Findings:

The information provided does not meet the minimum acceptable requirements of the Regulations. Prior to approval and in accordance with:

R645-301-528.323.1, The Coal Mine Waste Fire Extinguishing Plan (Appendix 5-3) must describe an alternative source of soil material for fire suppression, use of the salvaged subsoil is not acceptable.

R645-301-542.742, The PAP should clearly indicate which road surfacing materials will be buried under a minimum of two feet of cover and which fall under the requirements for four feet of cover.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

Section 241, 242, and 243 discuss topsoil and subsoil redistribution. Appendix 5.7 describes reclamation of the refuse pile. Appendix 5.8 describes the reclamation of the remaining area and divides the 48.23 acre site into two reclamation units based upon slope. The upper unit is a water treatment area and portal pad, approximately 3.4 acres. The lower unit is

37.37 acres.

Findings:

The information provided is adequate to generally describe the reclamation plans as required by the Regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

The PAP describes in Section 241 grading the surface to AOC, replacement of subsoils in the root zone, ripping, replacement of topsoil, replacement of boulders and gouging and treatment of the surface with an inoculum.

The grading sequence is itemized and begins with:

- "a. Grade all areas where no subsoil is being stored.
- b. Replace subsoil on areas from which it was removed."

SUWA commented that the sequence as written was very confusing. Crucial to the understanding of steps a and b in the regrading is an As-Built map committed to under Section 232.500 that will locate the subsoils determined to be suitable for placement in the top four feet rooting zone at reclamation, i.e. subsoil from soil map units SBJ, DSH and VBJ identified in the Order 1 Soils Survey. This proposed As-Built map is referred to in the discussion of Section 241 and 242.100.

SUWA commented on the depth of topsoil replacement, believing that the PAP called for eighteen inches of topsoil to be replaced over the entire site. Section 242.100 describes the replacement of topsoil to approximate the variable depth of topsoil encountered at the site during the Order 1 Soil Survey. Plate 2-3 Topsoil salvage and Replacement, should be referenced to illustrate and clarify the discussion found in Section 242.100. Section 242.100 also outlines the equipment to be used to replace the topsoil, including a road grader on the flat areas. A road grader is not recommended because of the compaction that can result.

Inoculum is referred to in Section 241 and soil amendments are referred to in Section 243. The inoculum will replace microbial activity in the soil. Re-establishment of biologic soil crusts would successfully add microbial activity while also serving to reduce erosion of the soil. The Division has requested that the Permittee attempt to establish biologic soil crusts on the surface of the topsoil stockpile. If successful, this source of biologic soil crusts could be utilized to inoculate the reclaimed site.

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Amendments will replace lost soil nutrients based upon testing of the topsoil stockpile prior to redistribution. The Division is not clear on the number of samples to be taken and the parameters to be analyzed during analysis of the topsoil stockpile before its use during reclamation. Appendix 5-8 indicates that a 16-16-8 fertilizer will be reapplied to the surface. In past reclamation, the Division has noted that the application of nitrogen was a detriment to the encouragement of native species. The Division recommends that the fertilizer application noted in Appendix 5-8 be based upon the results of the topsoil analysis at the time of reclamation.

Findings:

The information provided in the application is adequate for the purposes of the Regulations with the following exception. Prior to approval and in accordance with:

R645-301-251, The PAP should reference Plate 2-3 Topsoil salvage and Replacement, to illustrate and clarify the discussion found in Section 242.100.

R645-301-243, The PAP should outline the number of samples to be taken and the parameters to be analyzed during analysis of the topsoil stockpile before its use during reclamation and note in Appendix 5.8 that fertilizer choice and application will be based upon this testing.

R645-301-242.120, The PAP should eliminate from the equipment list any equipment that would create excessive compaction of the reclaimed surface. i.e. road grader.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

For this site, the Order 1 Soil Survey identifies microbial crusts on the surface of the soil. Microbial crusts stabilize the soil through protection of the soil from water and wind erosion.

The plan recognizes the need to re-introduce microbial life in Section 241, but does not specify a method. The best technology for re-introducing microbial life should be researched. An attempt to reestablish biologic soil crusts should be made on the reclaimed soil surface. The internet site www.soilcrust.org provides excellent references. Introduction of biologic soil crusts may be as simple as sprinkling the crushed organisms over the surface and irrigating as described by Jayne Belknap in the publication, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. The Division recommended earlier in this technical review (Operations Plan Topsoil Subsoil) that the growth of biologic soil crusts be encouraged on the surface layer of topsoil pile so as to be a source of inoculum during reclamation.

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Appendix 5-8 Reclamation and Enhancement Plan describes the means of soil stabilization including: gouging of the site to encourage a roughened appearance as shown in Figure 1; and placement of large rocks and boulders and vegetation; application of 500 lbs/acre wood fiber mulch and 100 lbs/acre of tackifier with seeding and then a second over spray of 1500 – 2000 lbs/acre of wood fiber mulch with 100lb/ac of tackifier and 200 lb/ac of 16-16-8fertilizer. Appendix 5-8 further describes the use of wood fiber mulch over topsoil.

In accordance with R645-301-244.300, rills and gullies that contribute to a violation of water quality or that disrupt the post-mining land use will be filled, regraded or stabilized.

Findings:

The information in the PAP does not meet the requirements of the Regulations with regard to stabilization of the soil surface and control of erosion and air pollution attendant to erosion. Prior to approval and in accordance with:

R645-301-244.200, The PAP should describe the inoculation of the site with biologic soil crusts.

RECOMMENDATIONS:

The Permittee should rework the PAP to include the information requested by this technical review to provide a very clear understanding of the operation and reclamation proposed.